# PACKAGE OF ROLLS OBTAINED BY A WRAPPING MACHINE AND METHOD FOR OBTAINING SUCH PACKAGE

## FIELD OF THE INVENTION

The present invention relates to packages formed by a plurality of rolls wrapped within a protective wrapping; these packages are obtained by a wrapping machine.

## BACKGROUND OF THE INVENTION

It is known that packages formed by wrapping machines includes group of rolls in which the rolls are arranged in one or two layers: each layer is formed by two or more rows (for example three, four or five rows), and each row includes one or more rolls (for example up to five rolls).

The rolls are destined to hygienic use (marked with the abbreviation BR) or to a different use, e.g. in kitchen (marked with the abbreviation KR).

The rolls disposed in the above mentioned layers are arranged horizontally (BR and KR types) or vertically (only the BR type).

The wrapping is formed by a sheet of synthetic resin; the wrapping machine enfolds the sheet in tubular form around the package of rolls, so as to overlap the longitudinal edges of the sheet, which are later heat-welded.

The four wings of each head of the tubular sheet, two vertical wings and two horizontal wings, are folded by folder means of the wrapping machine.

Usually, first the two vertical wings are folded inwards, to touch the rolls, and then the horizontal wings, upper and lower, are folded to overlap the ones previously folded. Welding the wings completes the package.

There are also other packages formed of packs of rolls introduced into bags, all obtained by the so-called bagging machines.

In the same conditions, the bagging machines are slower, more complicated and less flexible with respect to the wrapping machines; moreover the protective wrapping is a bag, thus it is different from the wrapping obtained by the wrapping machines.

The width and depth of the packages obtained by the wrapping machines depend respectively on the number of rows, on the number of rolls in each row, and obviously, on the diameter and axial extension (length) of each roll.

In order to increase the number of rolls for package, taking in consideration rolls having the same dimensions, the number of rows and the number of rolls in each row is changed.

This possibility is limited by the dimension of the wrapping machine; beyond certain package width and depth the machine functionality or productivity is not ensured.

## SUMMARY OF THE INVENTION

The object of the present invention is to propose a package, obtained by a wrapping machine, which package is formed in such a way, as to contain more rolls with respect to known packages, while keeping the same number of rows of rolls, keeping the same number of rolls for row and with the same roll dimensions.

Another object of the present invention is to propose a package which allows an increase of the production rate obtained by the wrapping machine.

A further object of the present invention is to propose a package which fulfills the previous objects using also pressed rolls.

The above mentioned objects are obtained, in accordance with the contents of the claims, by a package of rolls obtained by a wrapping machine, the package including a group of rolls composed of at least three layers of rolls, situated one over another; a sheet wrapped in tubular form around the group of rolls for wrapping the group of rolls, with the longitudinal edges of said sheet overlapped and heat-welded, and with the wings of each head of the sheet being folded against the rolls and then stabilized by heat-welding.

The package is obtained by a method including: forming of a group of rolls composed of at least three layers of rolls, situated one over another; wrapping of said group of rolls within a heat-weldable sheet in tubular form, with the relative longitudinal edges of the sheet being overlapped; inward folding of the vertical wings of the heads of the sheet against the rolls; heat-welding of said longitudinal edges performed in time relation with said folding, inward folding of the horizontal wings of said heads, so as to make the latter match with the previous, already folded, vertical wings, performed in time relation with the edges heat-welding; stabilization of the folded wings of said heads by heat-welding.

**BRIEF DESCRIPTION OF THE CLAIMS**

The characteristic features of the present invention are pointed out in the following description, with reference to the enclosed drawings, in which:

- Figure 1 is a perspective view of a first embodiment of the proposed package;
- Figure 1A is a front schematic view of the package of Figure 1, in a reduced scale with respect to Figure 1;
- Figures 2 and 4 show perspective views of other embodiments of the proposed package;

- Figures 3A and 3B show a front and lateral view of a further embodiment of the package.

**DETAILED DESCRITPION OF THE PREFERED EMBODIMENTS**

With reference to Figure 1, the general reference number 1 indicates a group of rolls R (e.g. of BR type), arranged horizontally and formed by three layers Z1, Z2, Z3.

According to the shown example, each layer is defined by five rows F1, F2, F3, F4, F5 of rolls, and each row is formed by five rolls R.

The package is obtained by a wrapping machine which wraps the group of rolls within a sheet 2 (film) of synthetic resin (e.g. heat-weldable material).

The sheet is in tubular form with relative longitudinal edges 3A, 3B heat-welded (Figure 1A).

The four wings 4A, 4B, 4C, 4D of each head are folded inwards (first the vertical wings are folded and later, in suitable time relation with the previous folding and heat-welding of the wings, the horizontal wings are folded and overlap the vertical ones), to touch the rolls.

The configuration imposed to the wings is stabilized by heat-welding.

The package C1 is defined by the group of rolls 1 and the sheet 2 wrapping it.

The characterizing aspect is that of proposing a package obtained by a wrapping machine, formed by at least three layers Z1, Z2, Z3, situated one over another.

In the shown example, there are five rows; it is understood the rows can be less (one to four rows) or more than five.

There are five rolls for each row in Figures 1, 1A. Obviously, the rolls in each row can be less than five, for example one to four rolls, or more than five.

Figure 2 shows a group 10 of rolls R*, of KR type, arranged horizontally; the group is formed by at least three layers Z1, Z2, Z3, situated one over another.

In the shown example, each layer is defined by five rows F1, F2, F3, F4, F5 of rolls R* and each row includes three rolls.

The group of rolls 10, includes the same number of rows and the same number of rolls R* for row, as the group of rolls 1.

The group of rolls 10 is obtained by a wrapping machine, therefore it is wrapped within a sheet 20 in the same way as described and illustrated with reference to the sheet 2 wrapping the group of rolls 1 of Figure 1.

The package C2, according to a second embodiment of the invention, is defined by the group of rolls 10 and the sheet 20 wrapping it.

Figures 3A, 3B shows a group 30 of rolls R1, of BR type, arranged horizontally.

The group of rolls 30, like the previous groups of rolls 1, 10, includes at least three layers Z1, Z2, Z3, situated one over another.

Each of the rolls R1 is press-squashed, on planes parallel to the related axis, in order to reduce their dimensions with respect to the traditional rolls.

The group of rolls 30 is produced by a wrapping machine which wraps it within a sheet 40, in order to define another embodiment C3 of the package, proposed by the invention.

The number of rows in each layer and the number of rolls R1 in each row are defined in the same way as for the packages C1, C2 of the previous embodiments.

Figure 4 shows a group 50 of rolls R2, of BR type, arranged vertically. This group of rolls is composed of at least three layers Z1, Z2, Z3, situated one over another.

According to the shown example, each layer is formed by five rows K1, K2, K3, K4 with each row obtained by putting the parallel rolls R2 close to each other.

It is understood that the number of rows can be less or more than five, and likewise, the number of rolls for each row.

The group of rolls 50 is formed by a wrapping machine which wraps it within a wrapping of a sheet 60, which is folded and stabilized, in the same way as the sheets 1, 20, 40 of the previous packages C1, C2, C3.

Still with reference to Figure 4, a further embodiment C4 of the proposed package is obtained by the group of rolls 50 and the sheet 60.

The group of rolls 1, 10, 30, 50 can be formed by using any method or apparatus, e.g. an oscillating delivery device, which oscillates between three levels. A layer of rolls is discharged at each level upon an elevator. Otherwise, an elevator with variable stroke is used, which cooperates with mechanical stop devices holding first one layer of rolls and then, two layers situated one over each other, so that another layer ca be formed on the elevator. This last layer pushes and raises the two previously formed layers.

The proposed package contains more rolls with respect to known packages, having rolls with the same shape, width and depth. This influences positively the wrapping machine production rate; this positive aspect results from the fact that the group of rolls included within the package includes at least three layers of rolls, situated one over another.

Another advantage derives from the fact that the proposed package is obtained by wrapping machines, which form a group

of rolls faster and in an extremely flexible way, with respect to bagging machines.

Consequently, the present invention provides a package obtained by a wrapping machine, in which a group of rolls includes at least three layers of rolls of BR or KR type, with horizontal or vertical axis, possibly press-squashed.